

REMARKS

Claims 17, 24, 27-29, 32-34, 38-40, and 42-43 have been amended. No new claims have been added. No claims have been canceled. Claims 17-18 and 24-43 are pending.

The drawings stand objected to. More specifically, the Office Action notes that the combinational logic 440 of Fig. 6 is not illustrated as receiving signal "C0_" as described in the second paragraph of page 12. The second paragraph of page 12, i.e., the paragraph starting at line 6 of page 12, has been amended to recite the correct combination of signals which serve as input signal to the combinational logic 440. Additionally, the Office Action also notes that Figs. 4A and 4B are inconsistent with pages 10 and 12 of the specification because the specification identifies the outputs of the circuits of Figs. 4A and 4B by reference signs VP2 and 242 while Figs. 4A and 4B only show reference sign VP2. The specification has been amended at pages 10 and 12 to refer to the circuit outputs using only reference sign VP2. Accordingly, the objections to the drawings should be withdrawn.

The specification stands objected to. The specification has been amended to identify the parent application by patent number and issue date. Additionally, page 10, line 20 of the specification has been amended to refer to reference numeral 290 instead of 240. Accordingly, the objections to the specification should be withdrawn.

Claims 24, 27-39, and 43 stand objected to due to minor informalities. Claims 24, 27-29, 32, 34, 38-39, and 43 have been amended as suggested in the Office Action. Accordingly, the objection to claims 24, 27-39, and 43 should be withdrawn.

Claims 17-18, 33, and 40-42 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 17, 33, 40, and 42 have been amended to address

the concerns expressed in the Office Action. Accordingly, the rejection under 35 U.S.C. § 112, first paragraph to claims 17-18, 33, and 40-42 should be withdrawn.

Claims 24-28 and 42-43 stand rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 8-11 of U.S. Patent No. 6,717,459. A Terminal Disclaimer with respect to U.S. Patent No. 6,717,459 is being concurrently submitted. Accordingly, the double patenting rejection to claims 24-28 and 42-43 should be withdrawn.

Claims 17-18 and 40-41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,126,590 (Chern) in view of U.S. Patent No. 6,486,728 (Kleveland). These rejections are respectfully traversed.

Claims 17 and 40 recite, *inter alia*, “four circuits, each of said circuits including: a primary phase circuit; a respective ancillary phase circuit, ... and a plurality of charge transfer circuits for transferring charge between said four circuits; wherein said four primary phase circuits are operated out of phase with one another.”

Chern discloses a multi-phase charge pump at Fig. 4. The multi-phase charge pump comprises a single primary phase circuit and a single ancillary phase circuit. More specifically, the Office Action identifies the primary phase circuit as the portion of Fig. 4 comprising transistors Q1, Q2, Q3, Q4, Q5, and Q6. The Office Action further identifies as the ancillary phase circuit the portion of Fig. 4 comprising transistors Q7, Q8, Q9, and Q10. Chern fails to disclose or suggest “four circuits, each of said circuits including: a primary phase circuit; a respective ancillary phase circuit” in combination with “a plurality of charge transfer circuits for transferring charge between said four circuits; wherein said four primary phase circuits are operated out of phase with one another.”


Kleveland discloses at Fig. 2 that multiple charge pumps may be used together to reduce ripple and noise, and to improve efficiency. However, Kleveland fails to disclose or suggest any charge transfer circuits for transferring charge between the multiple charge pumps. Accordingly, Kleveland also fails to disclose or suggest "four circuits, each of said circuits including: a primary phase circuit; a respective ancillary phase circuit" in combination with "a plurality of charge transfer circuits for transferring charge among said four circuits; wherein said four primary phase circuits are operated out of phase with one another."

Claims 17 and 40 are believed to be allowable over the prior art of record. Depending claim 18 and 41 are also believed to be allowable over the prior art of record for at least the same reason as their respective independent claims.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Dated: November 12, 2004

Respectfully submitted,

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